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*Dedicated to the Conservation of
Virginia's Wildlife and Related Natural Resources
and to the Betterment of
Outdoor Recreation in Virginia*

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COVER: Our bouncing bunny seems to express just the right spirit of exuberance and unbounded energy with which to plunge into 1965. He also is symbolic of the way cottontail populations have "bounced back" in many eastern counties from the low numbers of the past few years. There is more about 1964 rabbit populations on page 20. Our artist: Clark Bronson.

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Affection and High Esteem

THE Stars and Stripes wept at half mast in the quiet autumn air. A President was dead, and a nation had reason to recall with pride the deeds and words of an honored leader.

Herbert Hoover was many kinds of man—engineer, philanthropist, financier, statesman, and dedicated outdoorsman—before he became President. He was a great humanitarian, if one takes that term to describe a man with a bit higher regard for people than for other things.

It was as both outdoorsman and humanitarian that Secretary of Commerce Hoover spoke, more than forty years ago, when he observed that: "A fisherman must be of contemplative mind for it is often a long time between bites. These interregnums emanate patience, reserve, and calm reflection—for no one can catch fish in excitement, in anger, or in malice. He is by nature possessed of faith, hope, and even optimism, or he would not fish; for we are always going to have better luck in a few minutes, or tomorrow. All of which creates a spirit of affection for fellow fishermen and high esteem for fish. These are the essential qualities of good fishermen. This should be the attitude of good governments toward fish."

We are at great pains to conserve our forests, our lands, our waters, our fish and our wildlife. But our most important resource is people, and it is what these other resources can do for people that, in the last analysis, makes their conservation a worthwhile endeavor for mankind. Havilah Babcock seemed especially aware of what the other resources can do for people when, as he penned his final tale (of quail, and such) for last month's *Field and Stream*, he said:

"I have been hunting and fishing most of my remembering days, and I enjoy these diversions as much now as ever. But as a man grows older his concept of a good time changes. So does his idea about what constitutes a successful hunting or fishing trip . . .

"I still like to bring home something to grace the dinner table when I go hunting or fishing, and I can imagine no finer reason for going. The world was made to be lived in as well as looked at, and nature's supermarket is well stocked if you don't mind its self-service feature.

"But the size of the bag is no longer the sole criterion. I find, as I acknowledge the passing years, that the incidental gains—fringe benefits, they are called nowadays—are becoming more important, and I am growing more aware of the little extras that set a day apart and make the memory of it more fragrant."

Incidental gain and fringe benefit it well may be; but it is what the resource does to enrich the quality of the lives of people that gives to wildlife conservation both relevance and urgency in a society more than ever preoccupied with that very problem—the quality of the experience of human life.

The late President Hoover, as far back as 1924, was concerned with what a budding transportation revolution would do not only to the impact of people upon outdoor resources but, more importantly, to the resources' potential effect upon people.

"The automobile with its easy transit to all fishing centers *and the growing spread of fishing as a stimulus to outdoor life*," he said, "makes it necessary that we study the whole field of government activities and inaugurate new policies. If we do not we shall see our greatest national instructor of the calm and contemplative mind fail right in the middle of a most hectic civilization. It can not become too long between bites or patience will not endure."

President Hoover measured up well to his own rigorous standard for the good fisherman—a spirit of affection for fellow fishermen and high esteem for fish. So did Havilah Babcock.—J.F.Mc.

Boosts Virginia

HERE I am 1800 miles from Virginia but still am receiving my copy of *VIRGINIA WILDLIFE*. I would like to make a comment on what I think of Virginia and its wildlife and conservation program. I have been in quite a few states since I have been in the Air Force, but none can top Virginia for its hunting, fishing, and as a good place to raise a family. I come from a family of twelve. We all live in Virginia and find it unnecessary to go to other places to find outdoor recreation.

I would also like to comment on the way the Commission of Game and Inland Fisheries is putting the sportsman's money to good use by buying up recreation areas. I know that Virginia has one of the best programs of any state.

Larry D. Spraker
Glasgow AFB, Montana

Unusual Bird Record

A bird record which may be of interest to you and to Virginia ornithologists and bird-watchers is the observation of a female oldsquaw in Bath County. This bird was observed by myself, Mr. R. Frank Dugan, SCS Field Biologist, Richmond, Virginia, and Messrs. Dickerson and Moyers, SCS Work Unit men, on November 19, 1964. It was on a large farm pond on the Osborn Farm. Other waterfowl seen on the pond included two loons, about 10 horned grebes, a number of redheads, buffleheads, lesser scaup, ruddy ducks and a goldeneye.



OLDSQUAW

I am sure that there are numerous coastal records of the oldsquaw in Virginia but I expect that the bird is quite unusual in the western part of the state, and it is seldom a frequenter of farm ponds.

Philip F. Allan
Regional Biologist, SCS
Upper Darby, Pennsylvania

THE CITY: LABORATORY FOR LEARNING



For the child who lives at the bottom of a canyon of brick and steel, an evident and meaningful linkage with that which lies beyond the asphalt environment must be established.

MOST of us now live in some large urban complex, either in the city itself, on its fringes, or in a suburb.

The world of our grandfathers—the leisurely world of farm and small town—is a thing of the past for an increasing number of Americans. Weekends may bring delightful glimpses of a quiet countryside but the effort of getting there and back, in bumper-to-bumper traffic, often makes a wreck of recreation.

Conservation's New Setting

We are beset with *city* problems. Yet when we speak of conservation education we too often turn our backs on the urban scene and concentrate almost exclusively on the four great renewable resources—soil, water, plants and animals—in a *rural* setting.

For the child who lives at the bottom of a canyon of brick and steel, terracing and stripcropping can at first have little meaning or interest. Nevertheless, he may learn with absorbed interest about a “watershed” by tracing in his own city street the course of rain water down the cement hill into the gutter and finally into the storm sewer. How might this water be stored if it were needed? How is the city’s supply actually obtained and stored? Immediately, linkage with that which lies beyond the asphalt environment becomes evident and meaningful.

Problems of Urban Environment

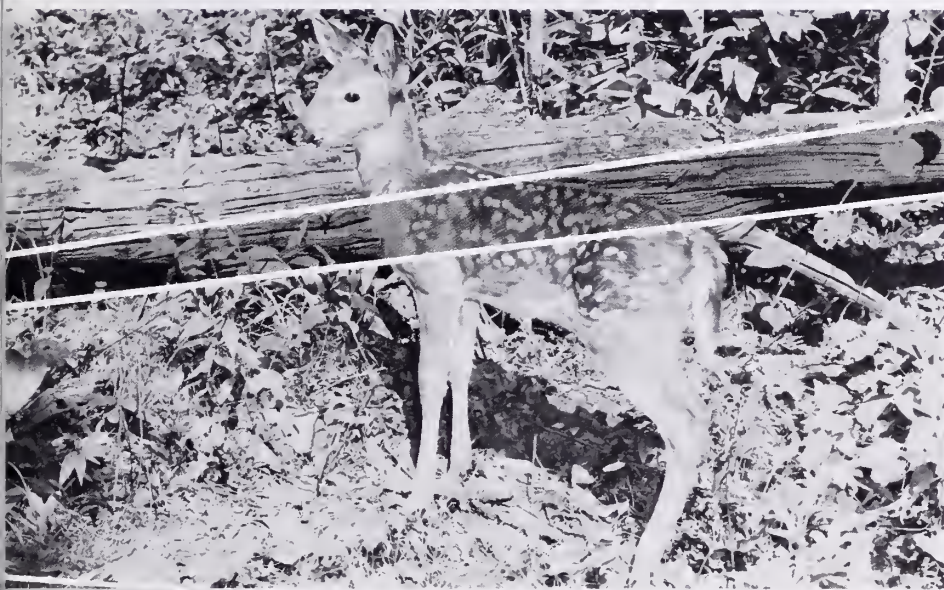
The problems of urban conservation are numerous and students are aware of the most acute ones. Overcrowding is certainly one of the primary difficulties resulting as it does in substandard living conditions, inadequate facilities of all kinds, water supplies poor in quality and quantity, snarled traffic, polluted air. Those who wish to escape and who can afford it, leave the city to live in the suburbs, only to find that problems of overcrowding are never far behind. And it is predicted that population pressures will increase to such an extent that today’s jam-packed area may well be tomorrow’s open space!

Our students, who will be living in that not too distant future, need to learn, and to learn fast, that better and wiser plans are needed if our planet is to remain a habitat worth living in. Planning must become a word of which we are no longer afraid. Planning is not antithetic to freedom. Free men have choices and if they are wise, they choose to plan.

The Teacher's Task

We, as educators, cannot escape the responsibility of helping our students learn the art of making enlightened choices—choices that will play such a vital part in shaping the future. We will need every tool at our command: science to supply the necessary data; social studies to point out the result of past decision-making; the humanities to nurture a sense of values. And we must begin where we are—in the crowded, maddening, remarkable and stimulating complex which is now our dwelling place.

Reprinted from the Conservation Foundation's "Bulletin on Conservation Education," Fall 1964 issue.





SQUIRRELS ON AN

By KATHERINE W. MOSELEY
Arlington

THE gray squirrels strut back and forth on the old rail fence under the oak trees. They seem to have leaped from the pages of a child's picture book as they go merrily wag-tailing along through the crisp, windless, sun-shiny day.

To the casual observer, one bright-eyed and bushy-tailed gray squirrel may look like any other gray squirrel; to those of us who live as their neighbors, no two are alike in anatomy, behavior or temperament. Each one, from the keen beady eyes to the fluffy, undulating tail, is a hunk of engaging personality.

Some are impudent and some are shy. There are the whimsical ones and the sad. Most are independent minded; a few are clannishly communal. We recognize the inquisitive ones and the born opportunists. All are graceful, rollicking bits of beauty that radiate a solid sort of natural animal happiness.

Whether they are appreciated or not, squirrels have become a part of the lives of people in the cities, suburbs and country. They lunch with office workers in city parks on bits of sandwiches and peanuts. They make regular rounds of bird-feeding stations in the suburbs. They rob the farmer's gardens and orchards. Especially do they seek out city suckers, like us, who live part time in the country in a house behind an old rail fence on a high knoll beside the Hazel river.

There is an ancient gnarled apple tree on our country place. The trunk is laced with ivy which we suspect is all that supports a hollow tree. There is a gaping knothole below the crotch of the first limb. One day we heard tiny squeals inside the tree. A tap quieted the squeals but after much internal scurrying we found ourselves looking straight into the eyes of a nervous adult squirrel with her head stuck out of the knothole. She scolded us fearlessly, though gently, as would any mother whose babies had been disturbed. For a week little Mother Squirrel defied us, the two Siamese cats, the crows and the blue jays to come near her nursery. She stood patient guard on the apple tree branches and

warned, nagged, scolded if anything or anybody came near.

We never knew when she moved her family, or where they went. We realized a devoted mother squirrel would carry her young to a safer retreat if she felt the nest was in danger. To her we represented danger.

A friend told of watching the removal of a squirrel family. He thought the reason was because of a hawk that circled the hickory tree that held the den-hole. He saw first the head of a baby squirrel in the hole and then the body was pushed out by the mother who was holding it tightly under her chin. She settled on a limb and placed both front paws under the wiggling infant until she could grasp it by the belly skin with her teeth. Then with her burden in her mouth she leaped from limb to limb, then to an interlocked tree, down to the ground and up to a hole in an oak tree where she placed the baby. She went back to the home-nest three more times and brought out a baby squirrel each time. On the fifth and last trip she was empty mouthed. This undoubtedly was to check that none was overlooked.

A squirrel nest we watched from the start was in the top of a hemlock tree close to the house. This mother squirrel used locust leaves and strips of elm bark for building material. These she would roll into a ball for easier mouth-carrying and scurry tirelessly, trip after trip, to the hemlock. The resulting accumulation was larger than a crow's nest, very bulky and awkward looking, but in it she raised her family.

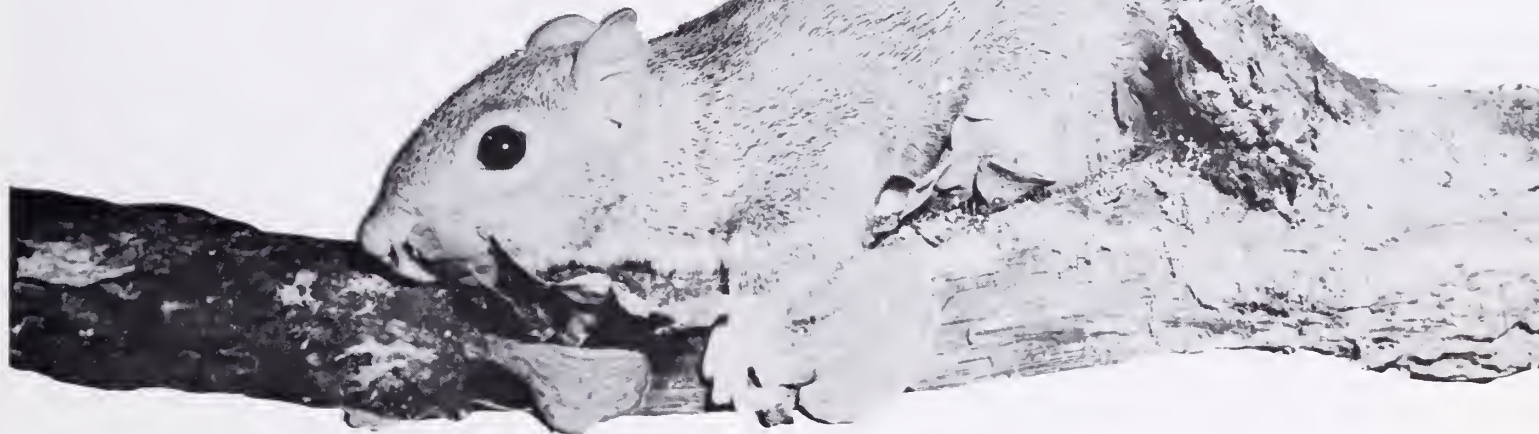
When the five babies were about six weeks, as we judged, they began to clamber out of the nest and make little experimental trips on the trunk of the tree before diving back into their home with happy squeals. As their claws grew longer they would venture farther down, liking the feel of the rough bark. Finally, gleefully, they made it to the ground. At about nine weeks their tails had feathered and they were ready to learn the art of leaping from limb to limb. Soon after, they were on their own as regular squirrels.

Canny wisdom and extreme cunning have helped the

squirrels outwit man from the time of the earliest settlement of our country. Pioneers used squirrels for food for survival. Squirreling meant almost constant rifle practice which made for expert gunmen. The fact that there are so many squirrels today is proof that *their* ancestors outsmarted the finest marksmen.

The squirrel's most baffling defense is sidling and freezing. When "freezing" it lies perfectly still, flattening its body so that it seems to blend into the burly bark of the tree. It sidles around the tree trunk using the tree itself as a shield. Their extraordinary intelligence and sense of prevision is evidenced by the stores of autumn seeds and nuts laid up in holes of trees and buried in the ground in readiness for barren weather. We have seen a squirrel sniff along the snow-covered earth and then begin to dig until it

OLD RAIL FENCE



Gray squirrels strut back and forth on the old rail fence under the oak trees. Their cheerful chatter and graceful bodies give pleasant animation to the woodlands and to our lives.

triumphantly paws out a nut.

On our place there are many diligent, hard-working squirrel citizens but we have collected an awful army of idolents who clean out the bird-feeders twice daily. At dawn and at dusk the rail fence becomes a squirrel highway to the welfare depot. The feeders hang from the oak trees and these characters manage to crawl, two at a time, into the seed bins and scatter grain like rain. It is a common sight to see two gray trails hanging from each feeder.

It was one of these tails that my husband tweaked. The squirrel, intent on foraging, never dreamed he was about to have his tail pulled. When it happened, the squirrel scrambled wild eyed from the feeder, leaped at the tree, missed, and fell flat on his face, recovered and bounded up the tree to the first limb. There he sat and cursed. He colored the air blue with his wrath. He spoke in crude, unmistakable terms his opinion of one gentleman who would pull the tail of another gentleman.

Most of our squirrels have magnificent tails which they use as furry rudders and balancing devices. One poor fellow has a skinny tail. He can signal with his rat-like appendage but he cannot wrap himself in it like a blanket for warmth. The lack of fur-tail appears to have little effect on his balance and it seems the real balancing act is nervous motion for he manages as well as his better endowed brothers—except for appearance. When his com-

panions groom their fluffy tails, he stalks off to torment the cats.

Old Rat-Tail sidles down a tree directly opposite to where the cats sit. They try to act nonchalant for they've been made fools of before. He clucks at them, barks, taunts them as he flirts his thin tail. We wonder if he is smart enough to realize what an irresistible rodent he must look to the pair of elderly over-fed Siamese cats. They watch from wide blue eyes measuring the distance as they crouch. The squirrel glides to the foot of the tree. The mouths of the cats work silently. Their tense leg muscles are poised ready to spring the tight cat-bodies like missiles. They finally leap and the squirrel sails easily up the tree just ahead of their more awkward climb.

The squirrels communicate by voice and signals. Quicker than a deaf man's hands the tails furl their messages. We have tried to determine if the number of tail-wags or jerks per cluck have a certain meaning. We do not know. We do know they have a song, a long drawn-out musical note, more or less rolling, which is very pleasant to hear.

It matters not if the squirrel on the rail fence is a self-important dowager or a smug, well-honed politician. Who cares if he is a plain country squirrel of plain speech or a crusty, garrulous, old city bore. What of it if she is a hussy or a gentle-voiced mother. All of them, with their cheerful chatter and beautiful bodies, give pleasant animation to the woodlands and to our lives.



Commission photo by Kesteloo

A high per cent of yearling spike bucks, like the deer in the background, is an indicator of poor nutrition. Yearling antler development like that in the foreground results from the same conditions that produce a high rate of fawn production and survival.

CHANCES are you haven't spent much time thinking about deer management. If you are a hunter you are concerned primarily with hunting, and only secondarily with management: that is, until the hunting gets poor.

Deer management means different things to different people, and this explains some of the difficulties we have with it. Deer management runs into trouble because in the initial effort to obtain numbers, we tend to forget about quality. When deer are scarce quality is automatic. When deer become too numerous, sooner or later we lose the quality which was taken for granted in earlier times. The complaints are common: too many does; too few bucks; deer getting smaller and antlers poorer.

Virginia's deer management program is based on the premise that quality is as important as mere numbers. This does not mean that quantity production does not have its place. It does. However, emphasis on quantity should be shifted when quality starts to lose out. The job then becomes a matter of determining when quality begins to decrease in the various herds and areas.

Deer research has come up with some practical guide lines that can be used to determine loss of quality. It is no longer necessary to wait for browsed-out ranges to appear, or deer die-offs, to prove that all is not as it should be.

Antler growth studies (Cowan & Long, 1962) have shown that body growth takes precedence over antler development in young, growing bucks. Further, Cowan and Long found through their restricted feeding experiments that if food was plentiful during the months of May, June and July, antlers would be of normal size, even though feeding was severely restricted during the winter "pinch period." No evidence was found that bucks failed to produce good antlers

DEER MANAGEMENT:

By JACK V. GWYNN

Game Research Biologist

for genetical reasons.

Since we know that a young, growing buck utilizes available nutrients first for body growth, with only surpluses in excess of growth requirements being used for producing antlers, we can make measurements of yearling buck antlers and use their condition, much like a thermometer, to take readings on the health of the deer herds and deer ranges.

In our Virginia investigations we have been using the number of spike bucks found in the yearling-buck age class. That is, we count the number of yearling (those bucks 1½ years of age) having antlers totaling two points, and compare this with the number of yearling bucks having more than two points. If we have a sample of 100 yearling bucks with 50 of them having antlers totaling two points, then this is called 50 percent spikes. Herds with 100 percent spikes in the yearling groups are found occasionally. Deer herds in the very best ranges average about five percent spikes. In Virginia, in an effort to compromise between quality and quantity, we have been striving for averages of 30 percent spikes or less in the yearling-buck age class.

Deer research also has determined the importance of nutrition in fawn production, and has determined many of the effects of inadequate nutrition upon doe deer and fawn development (Verme, 1962). As in some other animals, it was found that the demands for nutritive materials for the fetus are small in early pregnancy but increase progressively toward the end of gestation. Inadequate nutrition was found to start to retard fetal development at about four and one-half months of gestation. In Virginia this period would commence about the first of April. A low winter diet in combination with a high spring (mid-April to mid-June) diet resulted in the early death of a third of the fawns produced, while losses increased to more than 50 and 90 percent, respectively, when the low winter diet was followed by only a moderate and low spring ration.

These investigations showed that the major cause of death of fawns was postnatal nutritive failure. Nutritive failure caused death within 48 hours after birth for one or more of the following reasons: fawn born in very poor condition; fawn too small to reach the doe's teats; fawn not allowed to suckle; fawn unable to feed due to delayed or absent lactation in the doe. Sixty-nine percent of the fawns produced by does fed a low winter and spring diet were lost to nutritive failure, while another 21 percent were lost to stillbirths.

Since it has been determined that poor antler development in the young buck deer results primarily from inadequate nutrition during the months of May, June and July (when the antlers are being produced), it naturally follows that in areas where bucks have difficulty producing good antlers, the does will also have difficulty producing strong fawns. The poorer the yearling antlers the poorer the deer range; and the poorer the deer range the poorer is fawn production and survival.

A deer management program based upon the examination of those deer harvested is the most simple and practical

QUALITY VERSUS QUANTITY



Since growing bucks utilize available nutrition first for growth and then for antler production, antler measurements can be used to take readings on the quality of deer herds and their ranges.

approach. Changes constantly occur in deer numbers and in deer range carrying capacity. At present a lack of techniques and economic considerations restrict the collection and evaluation of all the information needed to keep us constantly abreast of all these changes. However, just as surely as drought affects the number of cattle that can be grazed on a given area, so do drought and other factors affect the number of deer that can be browsed on a given area.

Since range conditions are reflected by antler growth, examination of the annual deer harvest provides indirect but highly valuable measurements of deer numbers relative to changing food conditions. In Virginia other information is collected during the harvest period to reinforce information obtained on antler growth. These data, such as weights of yearling bucks, percentages of fawns in the harvest, percentages of yearling does in the harvest, and age ratios of both sexes, reflect annual trends in quality as well as quantity of our deer population and are useful tools in the making of sound deer management decisions.

In western Virginia, trained personnel easily obtain large samples of the fall harvest by manning various check stations picked strategically throughout the western range. In eastern Virginia it is more difficult to obtain adequate samples, due to the longer season and the more numerous check stations. With training, it would not be difficult for interested sportsmen groups to learn the techniques involved, and to use this method to impose deer management on eastern Virginia hunt clubs. Commission biologists are prepared to assist any club that wished to obtain this important information for use in management.

In deer herd management, it is quantity vs. quality: the choice *can* be yours!



U. S. Fish and Wildlife Service photo by Haddon

Quality?



Or quantity?

1964 Waterfowl Breeding Season Was a Success

By WILLIAM G. LEITCH, *Chief Biologist*
Ducks Unlimited



THE 1964 waterfowl breeding population was more successful than anticipated, in what was another hazardous and anxious breeding season.

Prospects at the beginning certainly were not encouraging. This resulted from a series of events which began the previous fall and summer. Last year there was little rain on the prairies after August 15 and abnormally warm weather continued well into October. As a result the evaporation period was greatly extended and there was little carry-over of water on the prairies for the 1964 season. The ground went into the winter season powder-dry and we knew that heavy winter snow would be needed if the potholes were to be replenished.

In this we were disappointed. Except for Manitoba and southwestern Saskatchewan, the prairies enjoyed a fine open winter. The heavy snows and great howling prairie blizzards which make duck habitat were not forthcoming. Snowfall was better in the parklands, but a dry soil and prolonged thaw with warm days and freezing nights resulted in relatively poor runoff.

The situation was greatly improved in northeastern Saskatchewan by a heavy rain during the first week of May. Falling on the soil, now saturated by the spring melt, the rain produced a good runoff into the potholes and sloughs. By May 15 water conditions were good all through southern Manitoba and eastern Saskatchewan. They were also fair to good in the northern parklands in Saskatchewan and Alberta due to carry-over from previous high-water years.

The western prairies, however, remained dry. In some areas there was sufficient water to entice the ducks to nest, but little chance of it lasting until the young ducks could fly. It was apparent that the 1964 duck crop would have to come from Manitoba, eastern Saskatchewan, the northern parklands and the Far North, and this it did.

The ducks distributed themselves in response to the water

situation. Surveys showed that breeding populations were increased in southern Manitoba and eastern Saskatchewan, unchanged in the northern parklands and decreased on the prairies, except for local areas such as in Ducks Unlimited's irrigation projects in southern Alberta.

No serious early spring blizzards interrupted the nesting season but in some areas the relatively wet and cold May appeared to partially retard it.

Mid-June rains maintained good water conditions in Manitoba and eastern Saskatchewan. Good rains also fell in southern Alberta, but these had little effect on the duck crop since the dry conditions of early spring had attracted few nesting birds. Central and western Saskatchewan remained dry. The shallow ponds disappeared and no doubt some production was lost.

Surveys run in late July showed good production from ducks breeding on secure waters. In eastern Saskatchewan and the Alberta parklands production was particularly good, compensating at least in part for prairie losses.

The northern surveys, flown in the first week in September, found duck populations about the same as 1963 in Manitoba and Alberta and somewhat improved over last year in Saskatchewan. Increases were noted particularly in widgeon, canvasback, and redheads, while blue-bills were reduced all across the north. Mallards and pintails were widely distributed in the flooded grain fields at The Pas in northern Manitoba and in the Peace River district in northern Alberta—making comparison with previous years difficult. Dabbling ducks showed up particularly well in northern Saskatchewan, especially widgeon, gadwall and shovellers, with good numbers of mallards in the Meadow Lake area of northern Saskatchewan.

Cool weather in early September moved blue-winged teal and some pintail southward. Major departures of blue-winged teal, in particular, were noted from the great marshes in southern Manitoba.

The widespread rains of early September and cool weather have begun to set the stage for next year's production season. Conditions as of the present (early fall 1964) are improved over the same time last year. There will be significant carry-over of ponds in Manitoba and eastern Saskatchewan and fall rains have begun to prepare the soil for a good runoff next spring. More rain is required so that the soil will be saturated when freeze-up comes and maximum runoff to prairie sloughs and ponds from melting snow next spring will be realized.

Reprinted from "Ducks Unlimited Quarterly," Fall 1964 issue.

WILL WETLANDS ACQUISITION BE SPEEDED

By Passage of the Wildlife Refuge Revenue Sharing Act?

By BUD MORGAN
*Midwestern Field Representative
National Wildlife Federation*

SINCE 1961, when Congress authorized \$105 million for a "crash" program designed to preserve waterfowl habitat by acquiring 2.5 million acres of wetlands, only 12½ per cent of that acreage has been acquired. Obviously, the program has fallen far short of its goal.

Major stumbling block to federal acquisition of desperately needed duck production habitat has been a provision in the enabling act (P.L. 87-383) which gave governors of the states "veto" power over federal land purchase. The provision "that no land shall be acquired with monies from the migratory bird conservation fund unless the acquisition thereof has been approved by the governor of the state or appropriate state agency" has been blamed for the acquisition program's lag behind its original time schedule. How important this has been remains to be seen, now that objections on the part of the governors have been removed in part, or in whole, through passage of legislation (S. 1363) which will provide for more equitable sharing of revenue with the counties concerned.

Brief background information is necessary to evaluate the situation which has existed, and how passage of this legislation may affect the acquisition program's future.

The Dakotas and western Minnesota have long been recognized as having the most valuable duck production habitat remaining south of the Canadian border. Personnel of the Bureau of Sport Fisheries and Wildlife had become increasingly concerned over rapidly dwindling production habitat being lost each year as a result of agricultural drainage. After many years of attempting to curtail or stop government drainage subsidies, the Bureau, state wildlife agencies and citizens' conservation organizations launched an all-out effort to acquire, under government control, sufficient production habitat to insure perpetuation of ducks. Realizing that time was running out and such habitat must be preserved while it still existed, the Federal

Government was requested to advance to the Bureau of Sport Fisheries and Wildlife the money necessary to carry on a "crash" acquisition program. These funds were to be paid back out of duck stamp revenue over a period of years beginning in 1969.

Authorization for this advance was provided under terms of P.L. 87-383 and \$7 million was first made available in 1963. Since that time, \$18 million has been advanced. In short, only \$25 million of the \$105 million program has been appropriated during the first four years of the seven-year program. This, of course, was not as much as either conservationists or the Bureau had hoped for. Even with this limited amount, opposition to allowing the Federal Government to purchase habitat, primarily due to language in the enabling legislation providing for the gubernatorial veto, has resulted in a serious lag in the proposed acquisition schedule.

Some governors refused to give the program the "green light" because of loss in tax revenue to local counties and subdivisions. Wetlands of a quality necessary for important duck production are not homogeneously distributed. One county, for example, may contain thousands of acres of highly productive habitat while others contain almost none. Consequently, one offering a large area of habitat would suffer unduly were a large acreage acquired in fee by the Bureau under its former method of reimbursing the county. One result of this problem has been that the Bureau has increasingly resorted to purchase of easements, leaving the land in private ownership and continuing it on the tax rolls. Since 1961, the Bureau has actually purchased only 64,473 acres in waterfowl production areas whereas it has obtained 90,946 acres in easements.

Now the passage of S. 1363, the so-called wildlife refuge revenue-sharing bill, is designed to overcome the objections

(Continued on page 22)

During high production years prairie potholes supply between 20 and 25 per cent of the Atlantic flyway's fall flight of ducks. Combating drainage and permanent loss of prairie potholes is of concern to hunters in the Atlantic flyway as well as to those of other flyways.



Fish Pond Fertilization: **CUT COSTS 66%**

By I. B. BYRD and H. S. SWINGLE

RECENT experiments by fisheries research biologists of Auburn University Agricultural Experiment Station and the Alabama Department of Conservation have demonstrated that the cost of fertilization can now be reduced approximately 66 per cent in most old ponds where fertilization has been practiced during the preceding three to five years and where pond weeds have been eliminated. Experimental ponds at Auburn University and state-owned public fishing lakes of the Department of Conservation and selected private ponds throughout the state have been used for conducting these fertilization experiments using phosphate only.

Ponds in many watersheds get sufficient potassium from pastures and croplands. Even in potassium-deficient soils, after a few years of fertilization with a complete fertilizer containing nitrogen, phosphorus and potassium, the bottom muds of a pond accumulate sufficient potassium so that this element is no longer needed in the fertilizer.

Accumulate Rich Store

After a few years of pond fertilization the bottom muds also accumulate a rich store of organic matter from decomposing microscopic plants. Certain kinds of bacteria that grow on this material are able to take the atmospheric nitrogen dissolved in pond water and transform it into a form which can later be released into the water as ammonia from the bottom muds. This ammonia, while providing a source of nitrogen together with that resulting from decomposition of dead plants and animals, is used to grow new crops of microscopic plants in ever-recurring cycles.

For this reason, it was found that nitrogen also could be eliminated from the pond fertilizer after a complete fertilizer had been used long enough to bring all underwater weeds under control and the bottom muds had accumulated the necessary organic matter.

While it was found that phosphate also accumulated in the bottom muds, this was changed into insoluble forms so that it was no longer available as a fertilizer. Consequently *fertilization with phosphate must be continued each year* or fish production will decline and pond weeds will again fill the water. Fortunately fertilization with phosphate only will cost approximately one-third as much as the use of a complete fertilizer such as 8-8-2 or 20-20-5. The average yearly cost of fertilizing with phosphate only will be about \$6.00 per surface acre of water.

"Most significant paper on farm pond management in years!"

ROBERT G. MARTIN, Chief, Fish Division

40 Pounds Per Acre

The amount to apply per acre at each application is 40 pounds of superphosphate or 18 pounds of triple superphosphate. It is more economical if this is placed on a platform about one foot under water. This allows the phosphate to dissolve in the top waters of a pond, where it is more readily utilized by the microscopic plants. Winds stirring the top water will distribute the fertilizer and microscopic plants to other areas of the pond. However, if platforms are not used, the phosphate can be distributed along the shallow edges from a boat or by hand from the bank.

It is suggested that pond owners who have kept their ponds well-fertilized for several years apply fertilization with phosphate on a trial basis. In most ponds, where underwater weeds have been controlled by fertilization, results should be satisfactory. However, phosphate fertilization may not make a pond "green up" as rapidly as the complete fertilizer in the early spring and, if the water stays clear, filamentous algae will grow on the pond bottom. Where such trouble occurs, it is suggested that the pond owners use 100 pounds of 8-8-2 or 40 pounds of 20-20-5 per acre application for one or two applications until the water becomes green, and then make additional applications with superphosphate or triple superphosphate only.

February 1—Time to Start

Where possible, the first application of phosphate should be made about February 1* of each year, followed by two more applications at two-week intervals. Additional applications should be made at three- to four-week intervals until November.

Whenever the water appears sufficiently murky with microscopic plants so that an object can not be seen deeper than 12 inches underwater, the next application may be postponed to a later date or omitted if the pond water maintains a dark green color. Most old ponds will normally require from 10 to 12 applications of phosphate each year.

The use of phosphate only for fertilizing old ponds should mean much to pond owners because of the money that can be saved by the use of this method. It is hoped that the perfection of this new method of fertilizing ponds will result in a higher production of fish in those ponds that have not been fertilized properly in the past because of the relatively high cost of fertilization. Also, all pond owners should now be more willing to have a continuous program of fertilizing their ponds.

*March 1 is the earliest recommended date for fertilizing Virginia ponds.

Reprinted from *Alabama Conservation*, a publication of the Alabama Department of Conservation. Mr. Byrd is Fisheries Section Chief of the Conservation Department's Division of Game and Fish; Mr. Swingle, fisheries professor, Auburn University.

Here's how to fertilize a pond. DO NOT attempt to broadcast fertilizer on the surface. Merely split open a bag of fertilizer and place it in shallow water. If using bulk fertilizer, place it in a perforated container and sink it. Currents and wave action will take care of dispersion.



VIRGINIA WILDLIFE

CONSERVATIONGRAM

Commission Activities and Late Wildlife News . . . At A Glance

12 INCH BASS LIMIT APPROVED FOR SHENANDOAH. The Commission of Game and Inland Fisheries set a 12-inch minimum bass size limit for the North Fork, South Fork and main stream of Shenandoah River at their regular meeting in Virginia Beach November 30. The regulation, effective January 1, 1965, includes the main river exclusive of tributaries from the Route 42 bridge in Timberville on the North Fork and from the confluence of North and South rivers on the South Fork downstream to the state line. Fishermen will not be allowed to have any largemouth or smallmouth bass less than 12 inches in possession while on these waters.

A daily creel limit of 2 and a minimum size limit of 26 inches for northern pike and muskellunge was adopted to give protection to these species recently introduced into Virginia waters. The Commission also imposed a daily creel limit of 5 trout on all impoundments. The purpose of this regulation was to help spread out the harvest on smaller National Forest and Game Commission lakes that are stocked with trout and subjected to heavy fishing pressure. This special creel limit does not affect the general state-wide creel limit of eight trout on all trout streams.

The sucker dipping season was changed to February 15, 1965, through May 15, 1965, to allow more opportunity for dip netting. This change does not affect an earlier season established for Rockbridge County.

The area where there is no creel limit on pan fish was extended to include all the zone where either North Carolina or Virginia licenses are honored on Kerr Reservoir upstream to Brantley Steam plant on the Dan River arm.

SIX BOAT RAMPS COMPLETED DURING SUMMER. Six new boat launching ramps were completed by the Commission of Game and Inland Fisheries this summer making a total of 45 developed to date under the program. Two of the new boat ramps were on the James above Richmond, one on the north side in Goochland County at the end of Route 634 and the other at the Route 45 bridge near Cartersville on the south side of the river.

In the Shenandoah Valley, Front Royal Landing at the Route 619 bridge was completed, improving access to the Shenandoah River. On the other side of the State, Folly Creek Landing was completed southeast of the town of Accomac, providing access to Metomkin Bay on the Atlantic side.

Two access points were completed on the Nottoway River, one at Peterson Bridge in Sussex County and the other at Corey's Bridge in Southampton County. All of these recently completed access sites include boat launching ramps and graveled parking facilities.

Next on the development schedule are three ramps in Gloucester County already under contract giving access to the York River and its tributaries. One of these will be Tanyard Landing on the Poropotank River off Route 617. Another of the planned York River Landings will be located at Gloucester Point beneath the George P. Coleman Bridge. The third will be Ware House Landing on the Ware River at the end of Route 621.

The contract has been let for a concrete ramp and graveled parking area at Scottsville Landing on the James River. Three access sites on Gaston Reservoir have been leased to the Game Commission by Virginia Electric and Power Company. The first of these scheduled for development is a 15 2/3 acre site in Mecklenburg County at the U. S. #1 steel bridge.



NICE TROPHY

By HARRY GILLAM, *Information Officer*



A large crowd admires entries in the state competition at the William G. Myers Gymnasium, Harrisonburg, October 31 just prior to the awarding of trophies and certificates.

TROPHY hunters in the Old Dominion fared a little better during the 1963-64 hunting season than they did the year before if entries in the Game Commission's Annual Big Game Trophy Contest are any indication. Heads entered in the lower classes (7-8 points and 6 points or less) in this year's state-wide competition averaged considerably higher scores than were recorded in these classes last year.

The east-west dividing line was changed for entries in this year's contest to correspond with the Commission's line delineating Eastern and Western seasons. The West regained top spot in the 9-point plus class, with a 10 pointer from Augusta County entered by Donald W. Houser of Churchville. The big buck scored 224-5/8 points, which was considerably below the 267-7/16 point state record head from Isle of Wight County which took top honors last year. The number two head in the top class was the Eastern Regional winner, a 205-5/16 point trophy from Southampton County entered by Paul C. Marks of Capron, Virginia. Other winners of certificates in this class were J. W. Payne of Arlington, third; Neil Miller of Bridgewater, fourth; and Stanley E. Shackleford of Waynesboro, fifth.

The best entry in the 7-8 point class was a Sussex County 8 pointer by M. H. Barksdale of Petersburg, which scored 184-5/8 points. Top head in the six point class went to a King George County head scoring 141-5/16 entered by Jack W. Loving of Dahlgren.

The best head in the Bow and Arrow class was an 8 pointer scoring 152-3/8 points taken in Botetourt County by R. W. Hawkins of Bedford. Second place went to a 152-3/8 point Craig County head entered by A. B. Harris of Newmarket. The top Eastern archery trophy entered by R. A. Rassman of Newport News placed fourth in the state competition.

A Rockingham County bear with a skull score of 24 entered by Ibert Fulk of Fulk's Run topped the bear division. A bear scoring 23-7/8 points entered by Mrs. Maria Crider of Broadway placed a close second.



Western Regional winners are: left to right, E. K. Carter holding R. W. Hawkins' buck which placed first in the bow and arrow class, Donald W. Houser with the winning head in the 9 point and over class, and Allen L. Campbell of Amherst with the Western 7-8 point class winner.

A spectator takes a close look at some of the trophy entries.



HEADS TYPIFY CONTEST

Regional Big Game Trophy competition is sponsored by local sportsmen's groups who provide prizes for regional winners. This year's Eastern Regional competition was sponsored by the Peninsula Sportsmen's Association. Heads were judged October 24 at the Municipal Armory in Newport News. The Western Regional Contest held October 29, 30 and 31 at the William G. Myers Armory in Harrisonburg was sponsored by the Harrisonburg-Rockingham Chapter of the Izaak Walton League of America. Since it was the West's turn to host the Game Commission-sponsored state competition, the heads entered were judged at Harrisonburg at the conclusion of Western Regional judging October 31. Only trophies entered in the appropriate regional contest are eligible for state competition. The Game Commission awards trophies for the top head in each class and certificates are presented to competitors in the next four places.

Deer trophies are scored by a point system similar to that used by the Boone and Crockett Club. Basically, the length, number of antler points and beam circumference are totaled for each antler and the difference between the two subtracted to get the final score. Thus, symmetry is an important characteristic of a high scoring head. Bears are scored by measurement of the skull.

Photos by Gentry, Harrisonburg



Three of the top heads in the state are: On the left, the winner of the bow and arrow class killed in Botetourt County by R. W. Hawkins of Bedford and held by E. K. Carter of Vinton. In the center, Donald W. Houser of Churchville displays his trophy which won the nine point or better class, an Augusta County buck with a total score of 224 5/8 points. On the right is M. H. Barksdale of Petersburg with his eight point Sussex County buck, which placed first in the 7-8 point class.

In addition to placing emphasis on the esthetic qualities of big game hunting, data from entries in this contest reinforce some of the biological data on the condition of deer herds. The best and most numerous entries tend to come from areas with growing deer herds or sections where herds have been stabilized to range conditions.

1963-64 VIRGINIA BIG-GAME TROPHY WINNERS

Class	Place	Name and Address	County of Kill	Point Score
9 Points or more	1st—	Donald W. Houser, Churchville	Augusta	224-5/8
	2nd—	Paul C. Marks, Capron	Southampton	205-1/16
	3rd—	J. W. Payne, Arlington	Loudoun	201-7/8
	4th—	Neil Miller, Bridgewater	Rockingham	200-3/8
	5th—	Stanley E. Shackelford, Waynesboro	Rockingham	197-7/8
7 or 8 Points	1st—	M. H. Barksdale, Petersburg	Sussex	184-5/8
	2nd—	Allen L. Campbell, Amherst	Amherst	171-7/8
	3rd—	E. B. Whitelow, Hinton	Rockingham	170-3/8
	4th—	Elroy Mathias, Winchester	Shenandoah	155-7/8
	5th—	David Suter, Harrisonburg	Rockingham	154-6/8
6 Points or Less	1st—	Jack W. Loving, Dahlgren	King George	141-5/16
	2nd—	Benny Trobaugh, Grottoes	Rockingham	136-5/8
	3rd—	Calvin D. Ritchie, Broadway	Rockingham	87-3/8
	4th—	Paul E. Dalton, Roanoke	Bath	77-7/8
Archery	1st—	R. W. Hawkins, Bedford	Botetourt	155
	2nd—	A. B. Harris, Crewe	Craig	152-3/8
	3rd—	William P. Stewart, Jr., Salem	Montgomery	144-3/8
	4th—	R. A. Rassman, Newport News	City of Newport News	143-1/8
Bear	1st—	Elbert N. Fulk, Fults Run	Rockingham	24
	2nd—	Mrs. Maria Crider, Broadway	Rockingham	23-7/8
	3rd—	Roy Huffman, Harrisonburg	Rockingham	21-3/8

WESTERN DEER HERD REPORT



Western Virginia sportsmen have seen improvements in deer weights and fawn production the past three seasons, and this year for the first time yearling buck antler development has shown marked improvement.

By JACK V. GWYNN
Game Research Biologist, Charlottesville

BASED on the 1964 data, it is evident that many of western Virginia's deer herds have improved markedly from their 1962 and 1963 status. The trends, as they have been recorded during the past three years, are summarized briefly in the following table:

Year	Percentage of Spike Bucks in 1½ Year Age Class	Average Hog-dressed Weights of 1½ Year Old Bucks	Percentage of Fawns in the Antlerless Deer Harvest
1962	60%	85.0 pounds	41%
1963	59%	89.2 pounds	44%
1964	33%	95.6 pounds	46%

At the time this article was written there had not been sufficient time for a thorough study and interpretation of the 1964 data from all check stations. However, data from 14 stations well scattered throughout western Virginia have been compiled, so that a discussion of current trends in deer herd conditions could be included in this issue of *Virginia Wildlife*.

Supervising and district biologists and their game managers have established a network of special check stations in western Virginia to sample annual deer harvests. These check stations are the same as other big game check stations except that they are attended by trained technicians who

are able to age as well as weigh and measure the deer they examine. Weights of yearling (1½-year-old) bucks, measurements of antler development of yearling bucks, dressed condition of carcasses, sex ratios, and other data are recorded upon special game tags.

This information is collected from check stations strategically located throughout western Virginia deer range to sample over 10 percent of the harvest each year. The data is transferred from game tags to data books, summarized, and then analyzed by check station and region.

During the 1964 deer season data was obtained from 21 western Virginia check stations, where over 1700 deer were examined by Game Commission personnel, Graduate students from the V. P. I. Wildlife Research Unit, fish biologists, fish management aides, Education Division personnel, game managers, game biologists and game biologist supervisors—all took time out from other duties and pitched in to help accomplish this important task.

Interpretation of the data is based upon the principles of deer herd reaction to various levels of nutrition, as described in another article in this issue (see page 8). Food energy is spent first for body growth in young growing bucks with surpluses used for antler growth. When there is no surplus, there is no antler growth. Antler

development can thus be used as a thermometer indicating the health of deer herds and deer ranges.

Western Virginia sportsmen have experienced improvements in antler development, weights and fawn production over the past three seasons. For the first time, the yearling buck antler development has shown marked improvement over past years. Yearling buck antlers in the very best ranges average five percent spikes or below. However, as a compromise between quality and quantity, our deer management goals have been tentatively set at keeping the proportion of spike bucks in the yearling class at 30 percent or below.

Fall weights of deer reflect the condition of the deer ranges during the period just prior to the harvest. Weights of yearling bucks at one station in 1962 averaged 63 pounds, with antler development averaging 95 percent spikes. This represents the extreme in underdevelopment thus far recorded in western Virginia deer herds.

A heavy acorn fall prior to the deer harvest period can produce fat deer in ranges where other foods, such as browse (twigs and buds), may be very sparse. When the acorn crop is heavy, excellent deer food is provided during the critical winter period of the year and the deer emerge in improved condition for fawn production and antler growth the following spring.

Acorn production is considered a primary reason for the 1964 improvement in the antler development and physical condition of our western deer herds. Acorn crops

as estimated by western Virginia field personnel were much improved during the winters of 1962-63 and 1963-64. This was in marked contrast to the poor acorn winters of 1960-61 and 1961-62.

Adverse weather and range conditions during the winters and springs of 1959-60, 1960-61 and 1961-62 are considered to be the basic factors involved in the deterioration of deer populations during this period. The winter of 1959-60 was especially severe, and late in ending. Persistent cold and several heavy snowfalls during the period between February 13 and March 28 broke state-wide records of over 60 years. In investigating the effects of various levels of nutrition upon doe deer and their fawns, Verme (1962) found that a harsh winter and a cold spring could lower the physical condition of doe deer sufficiently to increase fawn losses by 50 percent.

Legal harvests and other losses reduced deer numbers during the 1959-61 period, but the western deer herds' inability to replace these losses through healthy fawn production and survival was an important factor in holding populations below levels previously recorded. Deer had become too numerous for the decreasing carrying capacities of many of the western ranges, and the health and quality of the deer herds suffered.

Now again with a somewhat decreased population and the good acorn crops of 1962-63 and 1963-64, there has been improvement in fawn production, weights, and antler development. Population increases have been noted for some areas as well. The question to be answered is whether or not these signs of improved deer herd quality are real and lasting, or merely reflect the fluctuations of acorn production.

The fact that Virginia's western herds have improved in quality is impressive, and there is good reason to believe that management efforts are producing these beneficial results; but only if these improved quality measurements of western deer herds persist will there be positive evidence of deer management success. If poor acorn years should reverse the 1964 trend, then a re-evaluation of harvest goals may be in order if we are to justify our claim that we are truly *managing* our deer herds to get the most in sustained quantity and quality that our deer ranges are capable of yielding.



Adverse range conditions and harsh winter weather can reduce the physical condition of deer sufficiently to increase fawn losses by 50 per cent the following spring. The same conditions that affect the does' productivity are reflected in the bucks' antler development.

Commission photo by Kesteloo





By HARRY L. GILLAM
Information Officer

OLD Dominion anglers, like fishermen everywhere, are eager for a bit of documentary proof to back up their bragging, and as it turns out they have quite a bit to brag about. Entries for 1964 Virginia Wildlife Trophy Fish citations jumped about one-third over those received in 1963. With the beginning of the 1965 fishing season, the fresh-water citation program is scheduled for some important changes.

The most significant of these will be our tie-in with the Sports Afield Fishing Awards Program. Through an agreement with *Sports Afield* magazine, all qualified entries for Virginia Wildlife Trophy Fish citations will automatically be entered in Sports Afield's State Fishing Awards Program. Under this system, anglers will receive not only a state citation, but a Distinguished Anglers Award from *Sports Afield* if their fish meets the minimum weight requirements. Best in Species Angling awards will be given at the end of the year by *Sports Afield* for the top Virginia catch in each species.

A picture must accompany entries if they are eligible for *Sports Afield* awards. Also, to be acceptable to *Sports Afield*, entries must be submitted within 30 days of the date of catch. The Virginia Game Commission has established a 60-day time limit from the date of catch on all citation entries. These deadlines have become necessary to keep the records as current as possible throughout the year.

The great increase in largemouth bass entries has led the

NEW RULES FOR FISH CITATIONS

Commission to increase the minimum size to 3 pounds, in order to keep the citation meaningful. About half of the entries have been just over the 7-pound limit and some anglers have been able to catch several of this size in a single day's fishing. It is our intention to make the standards strict enough that catching a citation fish will be a memorable occasion in an angler's experience.

New Minimum Sizes

Species	Virginia Minimum	Sports Afield Minimum
Carp	20 lbs.	Not accepted
Channel Cat	10 lbs.	Not accepted
Crappie	2½ lbs.	2½ lbs.
Flathead Cat	20 lbs.	Not accepted
Gar	10 lbs.	Not accepted
Grindle	10 lbs.	Not accepted
Largemouth Bass	3 lbs.	9 lbs.
Pickrel	4 lbs.	4 lbs.
Smallmouth Bass	4 lbs.	4 lbs.
Striped Bass, fresh water	10 lbs.	10 lbs.
Sunfish	1 lb.	1 lb.
Brook Trout	2 lbs.	2 lbs.
Brown Trout	2 lbs.	2 lbs.
Rainbow Trout	5 lbs.	5 lbs.
Walleye	3 lbs.	8 lbs.
Kentucky Bass	3 lbs.	Not accepted
Rock Bass	1 lb.	1 lb.
White Bass	2 lbs.	Not accepted

The greatest increases in entries were largemouth bass, rockfish and sunfish. New records were set for almost every species. The first brook trout, brown trout, and rock bass entries were received during 1964. Of the original categories set up, only the spotted or Kentucky bass with a minimum of 3 pounds remains with no takers. These fish are found only in southwest Virginia and are difficult to distinguish from the largemouth.

In addition to giving recognition for outstanding fresh-water fish catches and establishing a system of record keeping for Virginia, the fishing citation program has been providing the Game Commission with some interesting and useful information on where trophy caliber fish come from. For instance, if you are looking for big smallmouths or walleye, the New River is the place to go. Kerr Reservoir produces more than its share of big crappies, and huge pickrel are taken with regularity from Lake Burnt Mills. Chickahominy Lake is the undisputed home of the big channel cats.

In addition to any scientific or management application, the information being accumulated has other practical value. For instance, when someone calls and says, "I just caught a three pound crappie and I was wondering if this might be the largest ever taken in Virginia," we can reply, "No Sir! Mr. Elmo Winn caught a 4 pound 8 ounce crappie in Buggs Island Lake March 8, 1964."

A general increase in rabbit populations this year affected approximately half of all the eastern counties.



Photo by Leonard Lee Rue III

November Game Survey Showed 1964 Crop Better Than Last Year's

By JIM McINTEER
Chief, Education Division

THE hunting season that is drawing to a close will not be a record breaker, but it should add up to a pretty good one just the same, according to the results of a state-wide survey that measured this season's populations against last year's as of the end of the third week in November.

Apparently the state-wide legal big game kill, which is accurately recorded through the checking and tagging system, will be down a bit from last year's, but the unrecorded bag of rabbits, squirrels, quail and grouse should have made this a banner year for small game hunters in most areas by the time all the tumult and shouting dies.

The observed increase in this year's squirrel populations was more general and widespread than that of any other species. About half the Eastern Piedmont and Tidewater counties recorded squirrel increases, while from all other areas increases were reported from an overwhelming majority of the counties.

Probably the most spectacular local increases occurred among the wild turkeys and grouse in the Southwest and Central Mountain areas. More of both these game birds than last year were observed throughout almost all of these two western ranges, with a decrease in each species reported from only a single county.

The least pleasing part of the picture shows the wild turkey failing to make much of a comeback from last year's



November surveys showed squirrels were more abundant than last year almost everywhere.

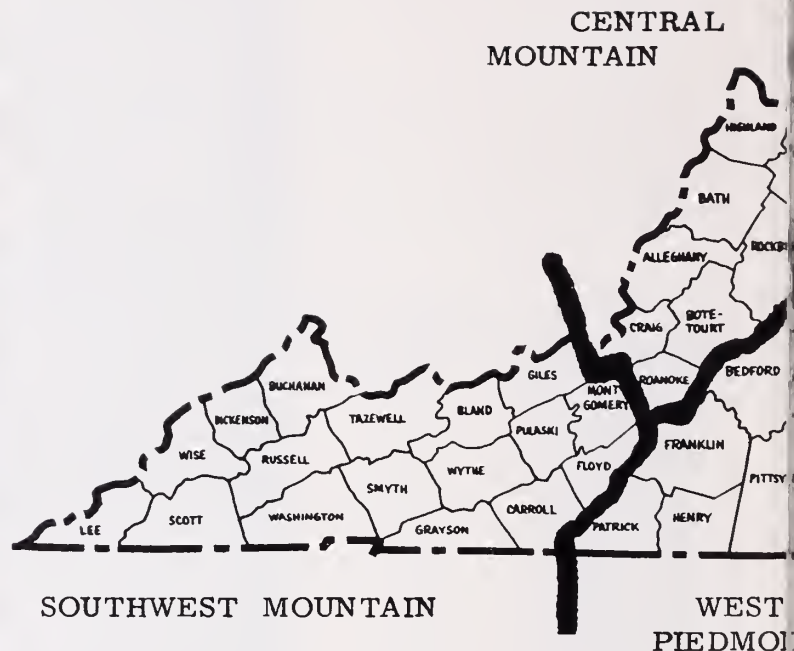
low in the Tidewater and Piedmont ranges. Counties where gains were noted were more than matched by counties in which a further decline was observed.

There was a wide variation in this season's deer abundance compared to last year's, too. A general decline in the number of deer was noted in most Tidewater and Eastern Piedmont counties, and those hunters in the east who had poor success those mid-November days probably were bucking a reduced population as well as the unusually hot, dry opening day weather. Elsewhere throughout most of the state the consensus of a majority of observers was that deer numbers were not drastically different from those of a year ago.

Quail increases offset decreases in a substantial majority of counties in the Southwest and in the Tidewater and Piedmont areas. Rabbit populations were substantially the same as a year ago in the Northern, Central Mountain and Southwest counties, but there was a widespread increase in rabbits this year affecting more than half of all Tidewater and Piedmont counties.

Game Abundance Estimates By Region

Northern—Rabbits—equal to last year; Quail—increases in some counties offset by declines in others; Squirrel—marked improvement over entire region; Grouse—equal to or better than last year; Deer—equal to last year with decreases in a few counties; Turkeys—at least equal to last year, with marked improvement in majority of counties.



Central Mountain—Rabbits—about the same as last year with improvement in a few counties; Quail—equal to or better than last year; Squirrel—marked improvement over most of region; Grouse—marked improvement; Deer—equal to or below last year; Turkey—marked improvement in most counties.

Southwest—Rabbits—equal to or below last year; Quail—equal to last year with improvement in about half of the counties; Squirrel—marked improvement in most counties; Grouse—equal to or better than last year; Deer—equal to last year with decreases in a few counties; Turkeys—marked improvement.

Western Piedmont—Rabbits—equal to or better than last year; Quail—equal to or better than last year; Squirrel—marked improvement; Grouse—marked improvement; Deer—equal to or better than last year; Turkeys—equal to last year with improvement in some counties.

Eastern Piedmont—Rabbits—equal to or better than last year; Quail—equal to or better than last year; Squirrel—equal to or better than last year; Grouse—equal to last year in counties where they are found; Deer—notable decrease in majority of counties; Turkeys—slight improvement in some counties, decline in others.

Tidewater—Rabbits—equal to or better than last year; Quail—equal to or better than last year; Squirrel—better than last year; Deer—equal to last year in half of region, decrease in other half; Turkeys—equal to or below last year.

NORTHERN



LAND USE CHANGES CLOBBER QUAIL

MAINTENANCE of adequate living conditions for wildlife is the keystone of wildlife management. No animal, not even the resourceful and intelligent human, can survive for long in a habitat lacking food, water, or shelter. Diminish an animal's environment, strip away the shelter that softens the brunt of winter storms, destroy nesting cover, remove necessary food sources, or otherwise disrupt the sequence of essential habitat elements and an area can be made as devoid of wildlife as if the animals were removed by deliberate extermination, according to the Wildlife Management Institute.

Destruction of habitat by man is the principal reason that areas may be without wildlife today. Natural causes, such as drought or fire, are overcome in time, but large-scale land-use changes, that permanently eliminate hedgerows or drain wetlands, can be more permanent. Such changes in land use are subtle, occurring so steadily over a period of years that the casual observer fails to notice them and may blame the disappearance of wildlife on other causes, such as overshooting.

An excellent chronicle of habitat destruction and wildlife loss is *Wisconsin Quail 1834-1962: Population Dynamics and Habitat Management*, listed as Technical Bulletin No. 30 of the Wisconsin Conservation Department, Madison 1. A comprehensive examination of the history of bobwhites in the Badger State, the useful bulletin has these telling comments:

"During the period from 1829 to 1962, the quail population reached a peak level in the mid-1850's and then steadily declined, interrupted only by recurring peaks at successively lower amplitudes. The decline from 1937 to 1962 was directly correlated with the loss of hedgerow cover. On the major study area of 4,500 acres at Prairie du Sac, the population fell from a high of 433 birds in 1933 to 0 in 1959.

"The Prairie du Sac quail population averaged 23 birds per mile of hedgerow cover from 1931 to 1950, during which time the miles of hedgerow cover exceeded one mile per 450 acres. When the ratio of miles of hedgerow cover to acres of study area declined to 1:650, the quail population disappeared."

Moral of the Wisconsin bulletin is that altering the food, shelter, or water pattern is mainly the reason why wildlife is not as plentiful or hunting as good as it was in the "old days" on some areas. Wildlife can be restored in these areas, but only if man is willing to provide the missing habitat factor.



Photo by Leonard Lee Rue III
Grouse populations were up last fall throughout most of their Virginia mountain range.

Will Wetlands Acquisition Be Speeded?

(Continued from page 11)

to land acquisition. It provides for $\frac{3}{4}$ of one per cent of the adjusted cost of acquisition to be paid to the counties in which land is purchased. One example of how this will affect nearly 210,000 acres now held by the Bureau in North Dakota, and upon which it has annually paid approximately \$12,000, is indicated by the new legislation which will increase revenue to counties approximately \$62,000. The question which remains is this: will this revenue-sharing adjustment result in a stepped-up acquisition program?

Many willing sellers have indicated a desire to sell. Some have signed options.

The recently-passed Interior appropriations bill did not increase the amount of monies for acquisition. The amount granted was the same as last year, or \$8 million, and the Congress urged the Bureau to stress control by lease, rather than purchase.

Lease of habitat will insure temporary relief. Leases taken on wetlands by the Bureau provide that no draining,



National Audubon Society photo by Cruickshank
The canvasback is a species for which the Atlantic flyway is wholly dependent upon the prairie pothole region for production of a fall flight. Deterioration of the pothole habitat in the late fifties and early sixties reduced Atlantic flyway canvasbacks and redheads to less than a third of their mid-fifties numbers.

filling or burning shall take place during the life of the contract. Few leases are in perpetuity. They contain no provision which prevents diversion of water supply needed to insure their duck production value. They do not afford the Bureau the right to develop the area by level ditching, diking, etc. They do not insure permanency nor do they provide for development which would increase the production value of the area. To insure continued duck production for the future, purchase of these areas in "fee" would be desirable. There is reason to believe that passage of the revenue-sharing legislation may not clear the way for a greatly stepped-up program of wetland purchase by the Bureau. Opposition continues to exist. Organizations of farmers and stockmen have openly declared their intention of resisting such a program.

Now that the only logical objection to allowing willing sellers to sell to the Bureau has been removed by providing a reasonable formula for reimbursing counties, only selfishness and unfounded propaganda will stand in the way of an accelerated purchase program.

Starting Them Young

*D. C. Tests Ways to Teach
Conservation to Small Fry*

HOW do small children in today's big cities learn about the plant and animal life and the inanimate natural resources that guarantee and foster human life on earth? It is unlikely that the children will learn from random experience since there is little enough of nature in their city lives. A chance vacation in the country may broaden their view, but then there is the question whether one ought to rely entirely on chance to produce the lessons that demonstrate the importance of the earth's plant, animal and mineral resources to man. Should city children be left unprepared to decide as adult citizens how to wisely use and preserve these resources?

The District of Columbia school system apparently thinks not, for last spring it tested a novel program of instruction in the life sciences with a view to making it a regular part of the curriculum in Washington's grammar schools.

The design of the program, broadly speaking, is to teach attitudes with facts. "We are striving (by means of science experiences) to reach such behavioral goals as: A desire to use natural resources wisely and an appreciation of the absolute need to work cooperatively with the forces of nature," says the program prospectus. The "science experiences" are projects like caring for and observing seeds, ants, earthworms, turtles and chicks. Each project is paired with a concept or attitude and one project-attitude combination is taught in each of the grammar grades from kindergarten to sixth grade. At the kindergarten level, the exercises and the concepts are very simple. The kindergarten children grow lima beans from seed, observing that a lima bean seed is alive and strong and will burst the confines of a small sealed bottle, for example. The children observe also that the seed needs understanding care to survive.

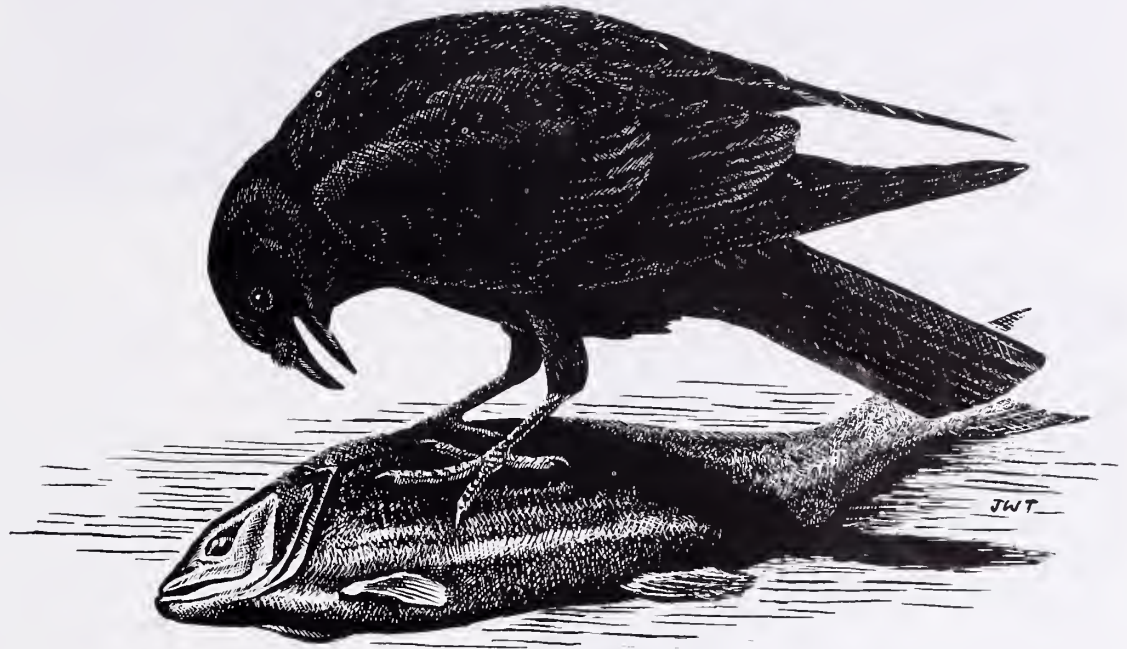
Because the project-concept combinations are inter-locking and follow a severe, logical sequence, the order of complexity mounts like compound interest as the children move from the lower to the higher grades. By the time the kindergartners reach the sixth grade they are measuring and systematically recording the air pollution in the neighborhood of the school, and are considering that "exploitation of the earth's resources must be controlled for survival" and further, that each citizen can help control this exploitation.

Already under their belts is experience of how the Anacostia and Potomac Rivers contribute to the beauty and life of Washington. Also on the way, the children have duly noted evidence, in the form of sediment and other pollutants, that man-made forces are arbitrarily changing these rivers.

"We must expose our children to an elementary appreciation of conservation of irreplaceable natural resources," said one teacher associated with the program. "They can learn in grade school that there is more to water than turning on a tap. They will be the young adults of the immediate future with twice our water problems and perhaps they will be more ready than our generation to vote for the right answers." A strict continuity across the seven grade-school years and strict adherence to a single idea—conservation—would seem to give the Crummell School program a good chance of success.

From Interstate Commission on the Potomac River Basin News Letter.

*Bird
of
the
Month:*



Fish Crow

By DOCTOR J. J. MURRAY
Lexington

NEXT to its voice the most distinctive thing about the fish crow is its appetite. All the crow family—crows, ravens, blue jays—are greedy and omnivorous. The fish crow will eat anything that has the slightest bit of sustenance in it. It parades the beach, working on the marine animals that are washed up, dead or alive, from the sea. It is a continual predator on the eggs of herons in their rookeries or on the nests of gulls and terns in the sand above the beaches. Flocks of them are continually on the watch in these nesting places, ready to pounce on the eggs or small young the instant a tern or a skimmer leaves its nest in search for food. Sticking its bill into an egg, the crow will carry it away to some quiet spot to feast upon it.

In Tidewater Virginia fish crows do considerable damage to the peanut crop, sometimes making a daily round of twenty miles or more to the peanut fields. Harold H. Bailey, who watched them for years, could never quite decide whether the fish crow's value as a scavenger offset its damage to man's economic interests.

It is easy to distinguish a fish crow from the ordinary crow by its call except in the early summer when the young common crows are first on the wing with their weak juvenile notes. The voices of the adults are very different. Instead of the clear, loud "caw" of the common crow, the fish has a weak, nasal, reedy call, like that of the young common crow. It is really the only way to distinguish the two species with ease. The fish crow is smaller, but this is

not much help unless the two are seen together and in a good light. A somewhat better mark but still not too easy to note is the scaly appearance on the back feathers of the common crow when seen in a good light.

The fish crow is supposed to be found only near salt water or up fresh-water streams where there is a tide. This is not the case in Virginia, even though the bird is much more abundant along the coast. As long ago as 1880 the famous ornithologist Robert Ridgway found this bird "exceedingly common" at Charlottesville. This was probably in winter, though even in winter the bird is not so common there now. According to Dr. Alexander Wetmore, it is fairly common at Luray and occurs in small numbers in the Shenandoah National Park. At Lexington and in other areas of western Virginia it occurs commonly in winter and regularly even in summer.

For a nesting place the fish crow is partial to pines and cedars. The nests are sometimes placed as high as seventy feet from the ground but generally considerably lower. They are like the nests of the common crow but much smaller. Four, five, or even six eggs are laid in May. They closely resemble the eggs of the common crow but are slightly smaller. As is the situation with many avian parents, the old birds are driven hard to provide food for the greedy nestlings. A young bird, you know, if it is to be satisfied, must have its weight in food each day.



Edited by HARRY GILLAM

Bowman's Bear



Woodstock Photo Shop
Vernon Stead of Edinburg poses proudly with the 145-pound black bear he bagged with bow and arrow during the archery season in early November. He nailed the big bruin in an apple orchard near Edinburg.

Help Offered in Planning a Shooting Field

A helpful and well illustrated new leaflet, "How to Plan a Shooting Field in the Northeast and Corn Belt," issued by the U. S. Soil Conservation Service, gives landowners and hunters good advice on laying out and developing shooting preserves, according to the Wildlife Management Institute. It shows how to lay out a shooting area, gives operating information, lists the various kinds of plants that can be used, and suggests where interested sportsmen can get additional technical help. Although not written specifically for Virginia, many of the principles should be the same. Copies may be obtained without charge from the Information Office, SCS, Department of Agriculture, Washington 25, D. C. Ask for Leaflet No. 532.

New Wildlife and Conservation Booklet Offered

"Making a Home for Wildlife on the Land," a 4-color booklet that tells the story of the use of soil and water conservation practices in rural areas, is the newest of a series of educational cartoon-type publications of the Soil Conservation Society of America. It emphasizes that conservation treatment of agricultural lands can improve the habitat for many kinds of wildlife, including birds, mammals, and fish, the Wildlife

Management Institute reports.

The color illustrations faithfully portray the many species of wildlife found on farms. The story of soil conservation is woven into a narrative about the experiences of an urban family at a vacation farm. Conservation farming, which involves proper land and water use, they find, can benefit wildlife.

Copies of "Making a Home for Wildlife on the Land" are available from the Society, 7515 Northeast Ankeny Road, Ankeny, Iowa, at 20 cents each in quantities up to nine. A sliding discount scale is provided for larger orders.

Record Number of 41 Whooping Cranes in Texas

The Department of Interior has reported that a record number of 41 whooping cranes have been sighted at Aransas National Wild Life Refuge in Texas.

There are 31 adults and 10 young, the latter also a record since a check has been made on the diminishing species.

The previous high in recent years was 38 birds seen in 1961-62. The former record for young birds was nine, sighted last winter.

In addition to the 10 young found at Aransas, there is still another at Monte Vista National Wild Life Refuge in Colorado. This one was found injured by Canadians and was given to the United States Fish and Wildlife Service to be cared for.

Wood Duck Renesting Notes

A rare record of wood ducks renesting after hatching a first brood occurred at the Patuxent Wildlife Research Center in 1964. As a part of a program of wood duck research, personnel of the Section of Wetland Ecology trapped and marked hens nesting in experimental nest boxes.

One hen hatched her first brood on April 11. The brood was observed again on April 13, but its fate is unknown. The second clutch of eggs was started 34 days after the first hatched. Although

embryos in 8 of the 10 eggs in the second clutch were partially developed, no eggs hatched. Another hen hatched a brood on May 4; its fate also is unknown. The second clutch of this hen was started on May 25 and hatched on June 19. The mother and five ducklings were caught in a bait trap on July 21.

In both instances the interval between hatching of the first clutch and incubation of the second was shorter than the span of time a hen wood duck devotes to rearing a brood of ducklings.

Archer Scores Bullseye on Running Deer



Staunton Leader photo by Sutton
Dennis Cupp of Falls Church downed this 90-pound doe early in the archery season in western Augusta County. A single arrow from his 41-pound bow went through the heart of the running animal from a distance of about 50 feet.

Help Stop Accidents

Virginia's hunting accident record appears headed for an unwelcome all-time high this season. Winter is a good time to start a Hunter Safety Training Program in your community. Your local Game Warden can help in obtaining course materials and instructors. Do your part in helping to keep hunting a safe sport. Its popularity and acceptance as a form of wholesome recreation depend on it.



Edited by DOROTHY ALLEN

Nature Camp 1964

(First Place Essay)

I have enjoyed Nature Camp very much. I think the classes have been very well taught. I have learned many interesting things here. Our experiences here have been invaluable. We are taught to recognize and appreciate many things we would have taken for granted. For instance, we know there is wild-life in the forests; we know the animals are there. But we have learned why they are there and what we can do to help keep them there. We have learned about wild plants and the important place they hold in the forest community. We have learned the interdependence of plants and animals. We have learned about the structure of the earth, how to identify rocks, all about the moon, what kind of weather cloud formations bring, all about the fresh-water community, how to identify trees, how birds live and many other things concerning nature. All this knowledge is helpful in understanding and appreciating our world. We have learned what conservation is and why it is important.

Besides learning, we have had a lot of fun. Hikes, daily recreation, the campfire have all been fun. Things like the trip to the firetower are fun as well as educational. The counselors and teaching staff have all been very helpful and understanding.

This camp has helped us in many ways. We have made new friends, learned to appreciate the world and have received spiritual instruction. All these will help us to grow up to be sound American citizens.

—Robert Jones
7th Grade, Suffolk

(First Place Essay)

Dear Father,

I have been trying to decide exactly what attracts me to Nature Camp. I believe that it is simply this—nature. Living close to and exposed to nature, I think that I begin to live in the pulse of the wild. As if I had been dead and have

Darrell Ferrell, Game Commission Educational Field Coordinator, instructs a class on mammals at Nature Camp. Mrs. Fred Schilling is Executive Director of the camp located at Vesuvius.



awakened. I became acutely aware of the birds singing from the trees, aware of the wild flowers hidden close to the ground, and suddenly feel the throb of life from the world around. I may sound melodramatic, but this comes close to the way I suddenly see anew. Before Nature Camp, I often remained buried in my own thoughts and sorrows, but now when I hear an insect buzzing at the screen, I look up with curiosity and interest. Nature Camp has aroused in me one of the most important needs for life, curiosity; but at the same time, I have met nice people and under the camp's perhaps unconscious training, I have become a better person.

Another part of Nature Camp has helped me even more. Here I have learned to have greater faith in others and try to open my mind to a new acquaintance's good points rather than stressing his bad ones. Also I feel a certain kin to other Nature Campers as if they were brothers and sisters because the friendship circle, singing together, classes, and the other group efforts serve to bring us together.

Besides being close to nature and almost a part of her, I feel that the people and the instruction are probably the most important parts of camp. Knowing that there is almost always someone who can answer your questions or a book from the library to enlighten you is a great help.

These and many other things mean the most to me at Nature Camp, but I would need a quiet forest glen and hours to name them all.

—Peter Mehring
9th grade, Coveseville

Conservation Education

The Arlington-Fairfax Chapter, I.W.L.A., is doing an excellent job of promoting conservation education among its members and youth of their area.

An annual Labor Day affair is an open-house barbecue on their 100-acre property near Centreville. During the afternoon of the 1964 event, Dr. G. B. Farrar, conservation chairman, conducted a conservation workshop among the pine-covered shores of their pond.

At their regular September meeting on "Trees," Fred Brown, game warden supervisor, showed a home-made movie of nature in fall colors. This was followed up with a leaf identification contest at their October meeting. Children with the most accurate and imaginative exhibits accompanied by a short article on "What Trees Mean To Me" were awarded prizes.

Dr. Farrar is actively engaged in encouraging the youth of the area to study nature. He has a leaf collection made of Formica, painted and labeled as study guides for his enthusiastic students of nature.



Edited by JIM KERRICK

Precautions

If you are considering doing some boating during the winter months, either for hunting or for other reasons, there are several precautions that you should take to insure a safe voyage.

1. **DO NOT OVERLOAD YOUR BOAT.** In most cases your boat has a capacity plate attached to stern indicating the **MAXIMUM** load that is safe for that boat. Take into consideration the extra clothing that you are wearing and, if hunting, the weight of your guns and ammunition.

2. **POST A PROPER LOOKOUT.** Heavy rains, snow and ice can carry logs and other debris into the boating waters. Ice can easily cut a hole in your boat or put your outboard out of commission.

3. **WEAR AN APPROVED LIFE-SAVING DEVICE.** Remember, you are going to have on heavier clothing and although you may consider yourself to be an expert swimmer, have you ever tried it in ice cold water? By wearing a lifesaving device, you are not only being extra careful, but the device will help protect you from the wind and cold even if you do not get a dunking. Play it safe.

4. **PLAN YOUR TRIP IN ADVANCE.** Take time to make a definite plan, anticipate the number of gallons of fuel that you will need for the trip, and above all let someone know where you are going so that help will be able to reach you quickly in the event of an emergency.



Speedometer Calibration

The accuracy of a speedometer can be checked by running a straight course over a measured mile. Measure a mile course by use of a chart or landmarks, then run the course at a constant speed noting time of departure and arrival at predetermined points. Compare elapsed time with this table:

MEASURED MILE	
Speed	Elapsed Time
20 m.p.h.	180 Seconds
25 m.p.h.	144 Seconds
30 m.p.h.	120 Seconds
35 m.p.h.	103 Seconds
40 m.p.h.	90 Seconds
45 m.p.h.	80 Seconds

Now Available

The Virginia Commission of Game and Inland Fisheries now has available a new digest listing of "Virginia's Public Boat Landings and Marinas." Landings and marinas are listed by county, showing the name of the landing or the marina, body of water available at that point, telephone number, docking facilities, and those that have fuel and repair service.

Copies of this digest may be obtained by writing to the Virginia Commission of Game and Inland Fisheries, P. O. Box 1612, Richmond, Virginia 23213.

No Anti-Freeze Needed, Outboarders

Go ahead and use your outboard motor in freezing weather. By taking just a few precautions your outboard will perform as well in frigid conditions as on the 4th of July, and there is no antifreeze needed.

While most of the late-season outboarding is done by hunters, more and more pleasure boatmen are finding that boating during the cap, coat and glove season can be great fun. As long as there's no ice covering your favorite cruising water, the boating season is open.

Most popular outboard motors are water cooled, with a pump bringing water from the lake or river on which you are traveling up to the motor, where it cools and then is discharged. Even in freezing weather, the water for the cooling system will not freeze in the engine if the lower unit is in the water.

The cooling systems of engines in most cases are thermostatic controlled, and even in the coldest weather, cooling system water is maintained at the correct temperature with this control. Engines will run smoothly and will not be over-cooled.

Boats can be safely kept in the water when it's chilly, but, again, keep the engine's lower unit in the water in case air temperatures suddenly dip below freezing. Of course, the rig should be removed from the water if ice begins to form on the surface.

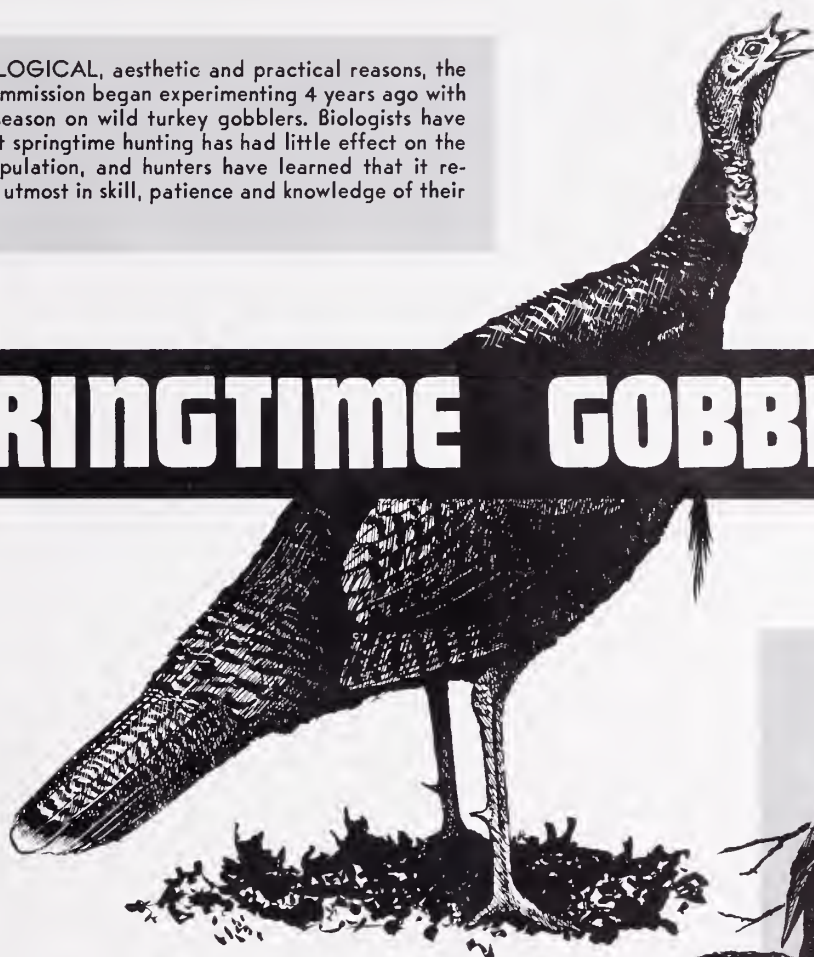
Touch-Up Time

Now is the time for skippers who have put their outboard rigs up for the season to touch up the scratches and dents.

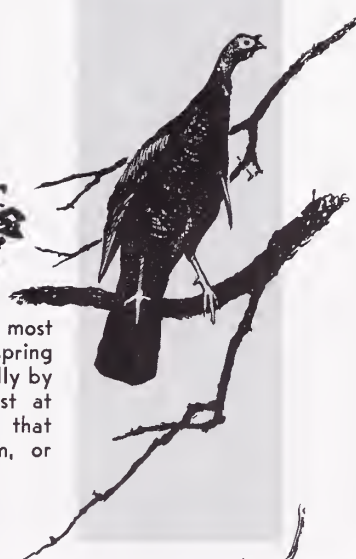
Easy-to-use spray cans of paint of factory colors in pressurized cans may be purchased from most marine dealers within your community.

FOR BIOLOGICAL, aesthetic and practical reasons, the Game Commission began experimenting 4 years ago with a spring season on wild turkey gobblers. Biologists have found that springtime hunting has had little effect on the turkey population, and hunters have learned that it requires the utmost in skill, patience and knowledge of their quarry.

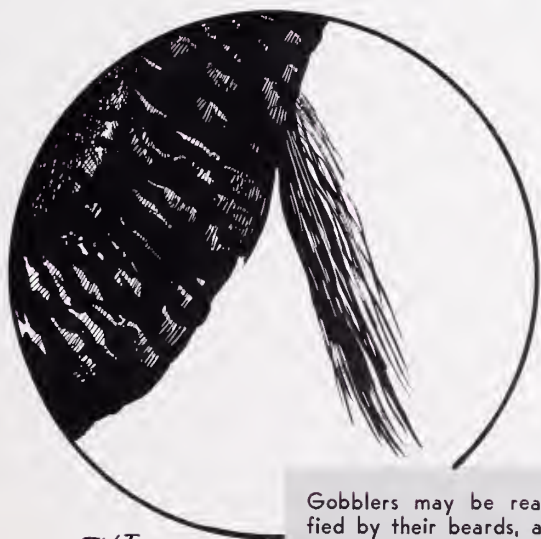
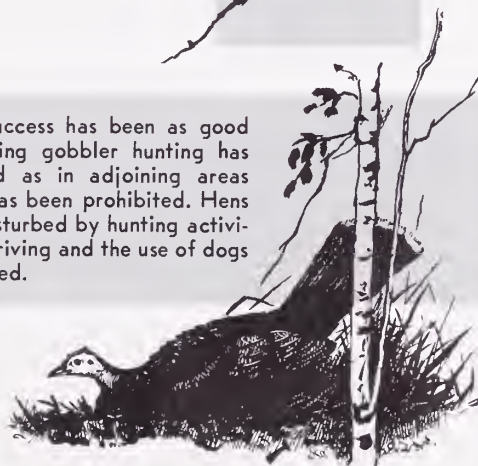
SPRINGTIME GOBBLERS



In contrast to fall hunting, when most birds are killed by chance, the spring hunter locates the gobbler, usually by hearing him call from his roost at dawn, then works exclusively on that one bird until he outwits him, or "spooks" him.



Nesting success has been as good where spring gobbler hunting has been tried as in adjoining areas where it has been prohibited. Hens are not disturbed by hunting activity, since driving and the use of dogs is prohibited.



JWT

Gobblers may be readily identified by their beards, and by their strutting and gobbling. Only bearded birds may be legally taken in the spring.



REMEMBER THE ***BIG ONES***
FOREVER . . .

with a Virginia Wildlife
TROPHY FISH CITATION!



NEW CITATION SIZES FOR 1965

Largemouth Bass . . . 8 lbs.	Crappie 2½ lbs.	Other Trout 5 lbs.
Smallmouth Bass . . . 4 lbs.	Striped Bass 10 lbs.	Channel Cat 10 lbs.
Kentucky Bass 3 lbs.	Pickrel 4 lbs.	Flathead Cat 20 lbs.
Sunfish 1 lb.	Walleye 8 lbs.	Carp 20 lbs.
Rock Bass 1 lb.	Brook Trout 2 lbs.	Gar 10 lbs.
White Bass 2 lbs.	Brown Trout 2 lbs.	Grindle 10 lbs.

RULES:

Fish must be caught in Virginia Waters by legal methods during seasons open for the taking of the species involved.

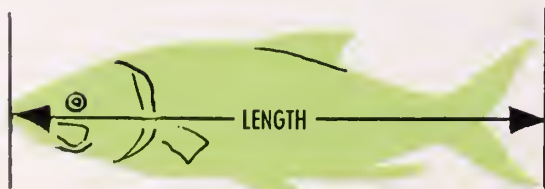
Fish must be weighed at a public scales that is periodically inspected by the Commonwealth of Virginia.

Photographs are desirable as further proof of authenticity but are not required.

Non-residents as well as residents are eligible for citations if fish are caught under the above conditions.

Applications must be submitted within 60 days of the date of catch to be eligible.

HOW TO MEASURE:



APPLICATION FOR VIRGINIA FRESHWATER FISH CITATION

Angler's Name _____
 Address _____
 City _____ Zone _____ State _____
 Kind of fish _____ Weight _____ lbs. _____ oz; Length _____ inches
 Where caught _____ Date caught _____
 Weighed at _____ (store or other public scales)
 Weighing witnessed by _____
 Signature _____ Address _____
 How caught—Fly Rod ☐ Spinning Rod ☐ Casting Rod ☐
 Trot Line ☐ Other _____

COMMISSION OF GAME AND INLAND FISHERIES
P. O. BOX 1642 RICHMOND 13, VIRGINIA